BARBER COLMAN

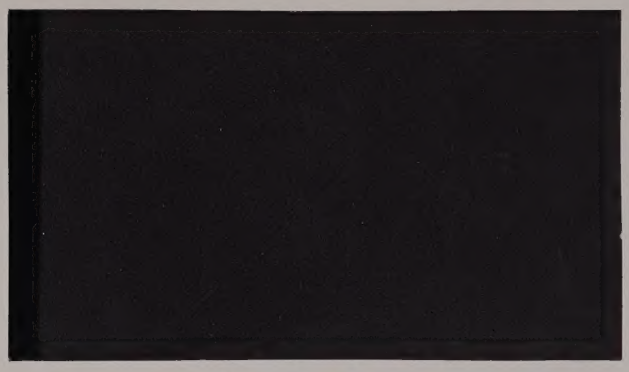
1212.1
IN 2

MODEL 141P and 192P

MILLIVOLTMETER INDICATORS

INSTRUCTION MANUAL

BARBER-COLMAN COMPANY
Industrial Instruments Div. • Rockford, Ill., U.S.A.



1212.1
IN 2

MODEL 141P and 192P

MILLIVOLTMETER INDICATORS

INTRODUCTION

This instruction manual is designed to help you secure maximum benefits from your new Model 141P or 192P Millivoltmeter Indicator. It should be given to persons responsible for installation, operation and maintenance of this instrument.

Your Barber-Colman factory trained field engineer is always available for further help in the solution of your control problems. Offices are located in all principal cities.

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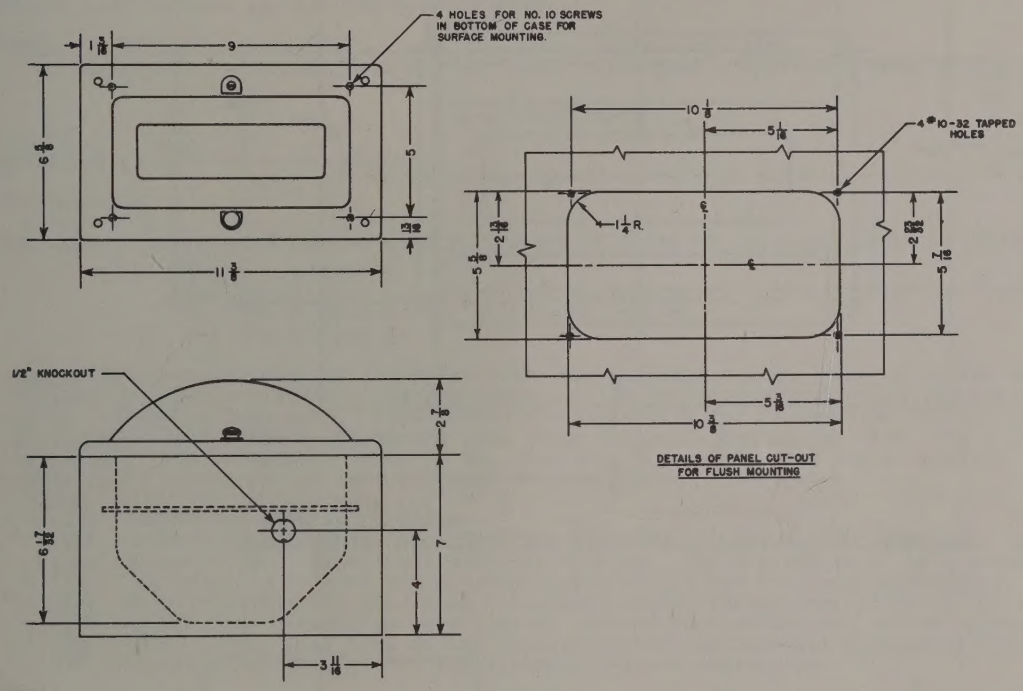
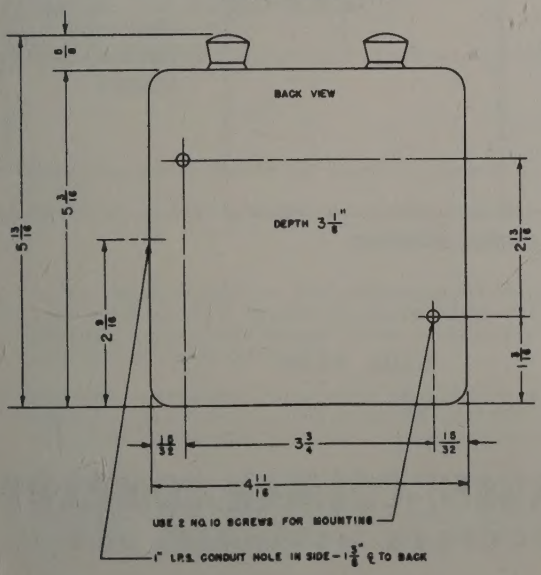
April 1966

Mounting Dimensions For Indicating Pyrometers and Resistance Thermometers

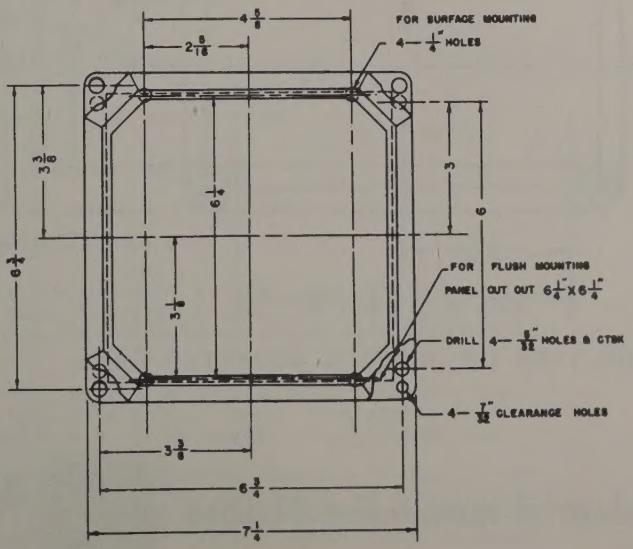
MODEL 141P INDICATING UNIT



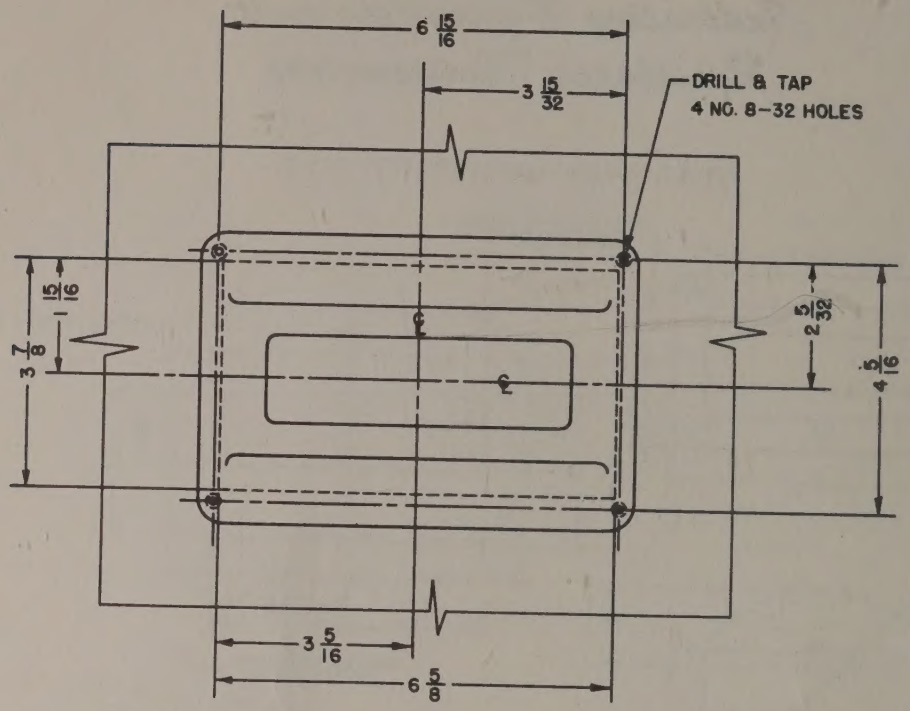
MODELS 43S, 44s-10 AND 44S-20



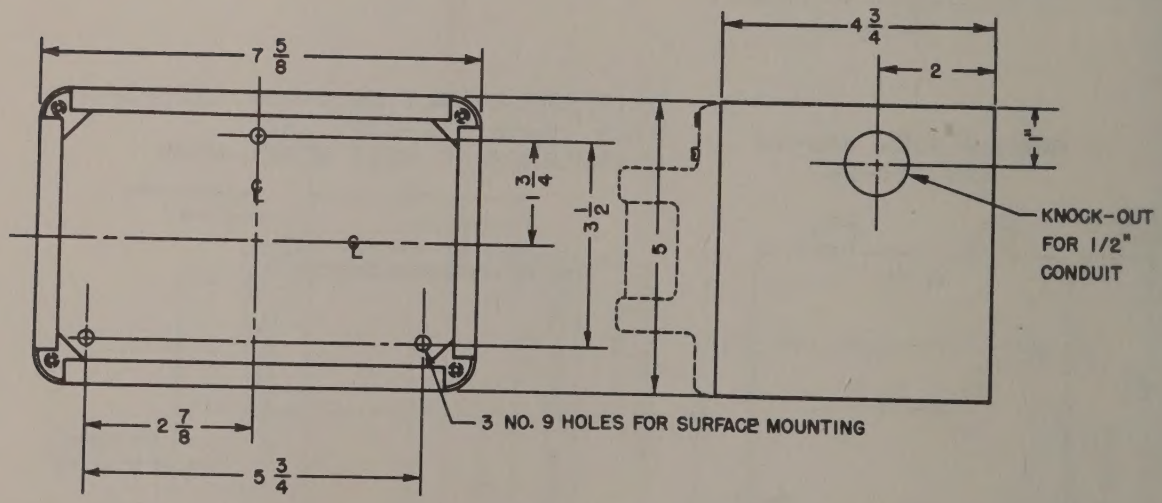
SWITCHES MODELS 810S-10, 810S-20, 811S, 820S AND 821S AND STANDARDIZING UNIT MODEL 875S.



MOUNTING DIMENSIONS FOR INDICATING PYROMETER MODEL 192P



DETAIL OF PANEL CUT-OUT FOR FLUSH MOUNTING



TOP VIEW OF SURFACE MOUNTING CASE

SIDE VIEW

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Indicating Pyrometers

UNPACKING THE INSTRUMENT

This precision instrument and its associated equipment have been carefully packed at the factory. Remove the instrument and its accessories carefully from the packing box and check the part numbers against the packing slip.

CAUTION: Handle with care. Avoid oil accumulation.
Safeguard instrument from shock. Keep instrument temperature under 130°F.

SPECIFICATIONS

Refer to Specifications on Scale Plate.

A. Thermocouple:

The type of thermocouple to be used with meter is shown on the scale plate as follows:

C/A	or Type K	
I/C	or Type J	CrC or Type E
Pt. 13%	or Type R	CuC or Type T
Pt. 10%	or Type S	

B. The external resistance for which the meter has been calibrated is shown at the bottom of the scale pan and is the combined resistance of the thermocouple plus the resistance of the extension lead wire. Some meters are calibrated for 15 ohms and usually require an external resistance compensating plug which is to be installed at the lead wire terminals. The resistance value of the plug should equal 15 ohms minus combined approximate resistance of lead wire and thermocouple.

External Resistance Marking On Scale

1. All instruments marked "15 ohms" require an External Resistance Compensator which is located in rear compartment of meter housing. The resistance of this compensator is to be equal to 15 ohms minus actual value of T/C and T/C lead resistance.
2. All instruments marked other than "15 ohms" were calibrated for actual value of T/C and T/C lead resistance specified at time of manufacture and unless installation was changed since that time do not require either the External Resistance Compensator or other form of compensation for external circuit resistance.

LOCATION

A. The instrument should be located to avoid vibration, shock, dirt, moisture, oil dripping and temperatures over 130°F. Example: Avoid furnace walls, machine frames, contactor panels, and outside walls.

B. Glaring reflections on the scale window should be avoided.

MOUNTING

A. Moderate care should be taken to mount the instrument level.

B. Mounting dimensions shown on mounting dimension sheet.

WIRING

A. It is recommended to run thermocouple extension lead wire in pipe, conduit or Greenfield (BX) over entire length in accordance with local electrical code. Do not run in same conduit with other power lines. More than one thermocouple extension lead wire may be run in the same conduit.

B. Use only extension lead wire supplied with the instrument or extension lead wire correct for use with the type of thermocouple specified on the scale. Ordinary copper wire will NOT serve the purpose. Reversed extension lead wires result in wrong readings.

C. Proper polarity (+) and (-) of the extension lead wire must be observed to obtain true readings. Upscale direction of the pointer movement is not sufficient evidence of correct polarity. Normally, the color coding is indicated on a tag attached to the extension lead wire when shipped. The following procedure definitely checks the correctness

WIRING (Continued)

of extension lead wire polarity: Attach the lead wire (without the thermocouple) and twist the free ends together; heat the junction thus formed. Deflection upscale means polarity is correct for the lead wire connections to the meter. If the indicating pointer moves downscale, reverse the wires at the meter.

D. The thermocouple should then be connected to the extension lead wire and the pointer should move upscale when the thermocouple hot junction is heated. If the indicating pointer moves downscale, reverse only the connections at the thermocouple head, since the extension lead wire has already been correctly connected to the meter terminals.

ADJUSTMENTS AND CHECKS BEFORE USING

A. After the instrument is mounted on the panel, disconnect the shunt wire or link located on the meter at the (S) terminal. This connection electrically dampens the meter movement for protection during installation or handling.

B. Check meter indication on open circuit by disconnecting thermocouple. The pointer should come to rest at the ambient (meter) temperature. It is NOT supposed to read zero.

C. If the pointer does not come to rest at the ambient temperature, it should be adjusted by slowly turning the zero adjuster screw (ZERO ADJ.) until the pointer rests at the instrument temperature, as checked by a thermometer with its bulb directly on the meter thermocouple terminals. Reconnect the circuit after the checking is completed.

D. This instrument is equipped with automatic cold junction compensator. By using extension lead wire from the thermocouple cold end to the meter terminals, the effective cold end is brought to the instrument. The compensator then causes the pointer to follow changes in room temperature eliminating the necessity of changing the ambient (meter) setting.

OPERATION

The indicating pointer will move to indicate the temperature of the hot junction of its connected thermocouple. All power for the meter is generated by the thermocouple, no dry cells or batteries are necessary.

MAINTENANCE

A. Do NOT oil or grease any part of the instrument at any time. Pivot and jewel construction is used for the meter movement.

B. Check cold end or ambient meter setting regularly, as explained under "Adjustment and Checks Before Using."

C. Inspect all terminal connections regularly.

D. Be sure lead wire and thermocouple polarity is correct and wires are not damp or grounded or an error in reading will result. Only the hot junction of the thermocouple may be grounded.

E. Inspect thermocouple regularly. Examine for signs of deterioration such as scaling or breaks. Replace thermocouple when these indications become more than a trace as accuracy may be effected. The protecting tube should also be examined for leaks.

CHANGING LOCATION

A. Replace the shunt wire or link at the (S) terminal on the under side of the meter as originally shipped to protect the meter during handling.

B. If possible use the same length extension lead wire of correct material when relocating the instrument.

Industrial Instruments Division BARBER COLMAN **BARBER-COLMAN COMPANY**
ROCKFORD, ILLINOIS, U. S. A.

APRIL 1966

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